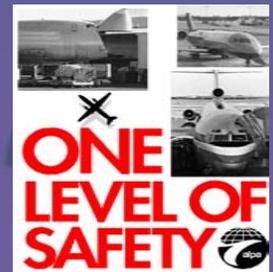


Flight and Duty Time Issues in Air Cargo Operations

The Call for One Level of Safety

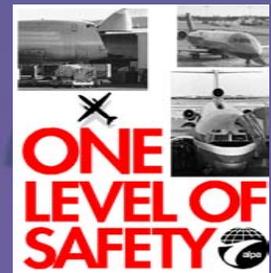
Presented by

Capt. David J. Wells,
Air Line Pilots Association, International



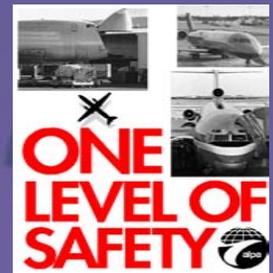
49 U.S. Code §44701

- Requires Administrator of FAA to set standards for air cargo and passenger carriers “in accordance” with the duty of those carriers to provide service with “the highest possible degree of safety,” in the public interest.



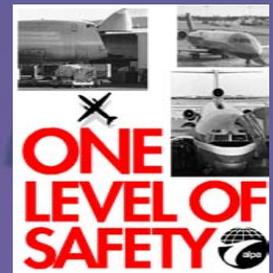
Air Carrier's Duty

- Passenger and Cargo Common Carriers by Air are required to perform operations with the “Highest Standard of Care”
- FAA oversight of this standard is mandatory
- FAA Single Level of Safety Initiative



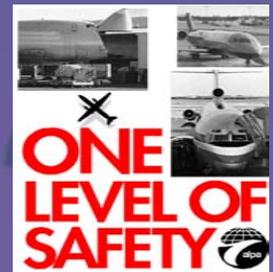
Federal Aviation Regulations (Flight and Duty Time Rules)

- Domestic
- Flag (International)
- Supplemental



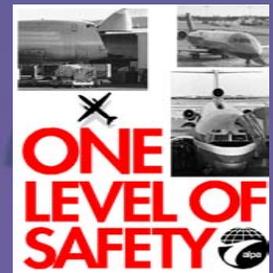
Definitions

- Flight Time
- Duty Time



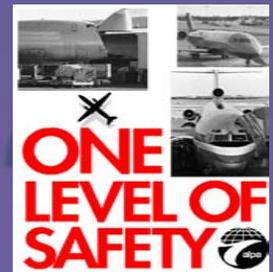
Domestic

- Pre-Flight Rest Requirements
- Flight Limitations (at the controls)
 - 8 hours per day scheduled
 - 30 hours per week
- Daily work limit (flying and non-flying duties) - 16 hours per day



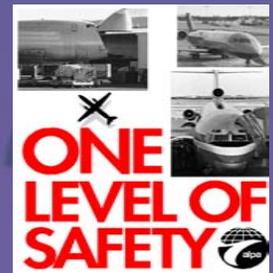
Flag (International)

- 8 hours per day (at the controls),
- up to 12 hours with 3 man crew
- 32 hours per week (at the controls)



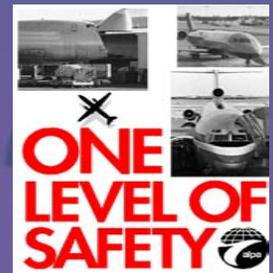
Supplemental

- Flight hour limitations
 - 8 hrs per day,
 - or up to 12 hours with 3 man crew
 - But, up to 48 hours per week at the controls
- That's **60% more**
than passenger air carriers!



Yearly & Monthly Limits

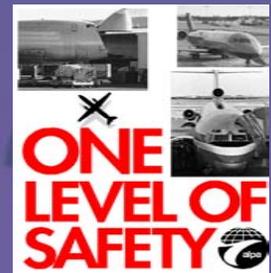
- 1000 hrs/yr
- 100 hrs/month
- Exceptions: Flag & Supplemental
 - 120 hrs/month
 - 350 hrs/quarter



One Level of Safety

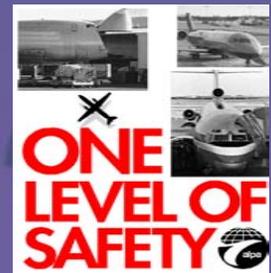
Passenger v. Cargo Carriers

- Same Equipment
- Same Routes
- Same Airspace
 - Yet Cargo Pilots may fly 60% more hours per week



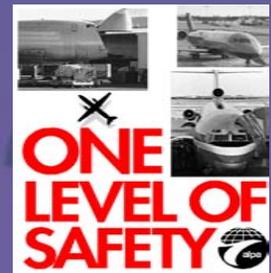
Basic Principle #1

- Flight/Duty Cycle should not prevent the aircrew from being able to ensure that they are fully rested before starting each duty period.



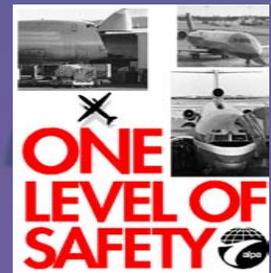
Basic Principle #2

- The duration and timing of the individual duty cycle must enable the aircrew to maintain acceptable levels of alertness at all times



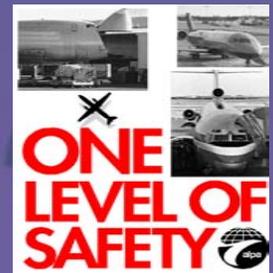
Preflight Rest Requirements

- Domestic rules pilots must have preflight rest of at least 8 hours so that they will be fully rested to commence the duty cycle
- Supplemental and Flag pilots have NO regulatory preflight rest requirement.



24 Hour Layover

- Post-Flight Sleep
- Pre-Flight Sleep
- Change Body Clock 12 Hours



FLT SCHEDULE CHANGE ALERT

ATTN:

PLEASE PASS THIS MESSAGE TO THE FOLLOWING
FEDEX CREW MEMBERS

CAP: WELLS, DAVID ROOM# 756
F/O: ELMIGER, GEORGE ROOM# 750
~~CH/MP~~
RFO: GILVERNALL, JAMES ROOM# 517

DEAR SIRs,
YOUR FLT SCHEDULE HAS BEEB REVISED DUE TO
 MTC SO, YOUR OUTBOUND SCHEDULE
AS FOLLOWS :

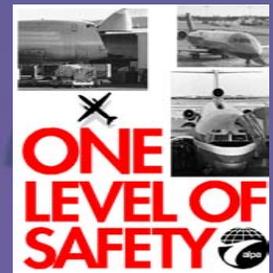
*ALERT TIME UNK LCL
*PICK-UP TIME UNK LCL
*DEPARTURE TIME UNK LCL
*YOUR FLT IS 80-23 / 591

IF YOU HAVE ANY QUESTION, PLEASE CALL TO NRT OPS
FEDEX NARITA RAMP OPS: PHONE# 32-6312 FAX# 32-1692



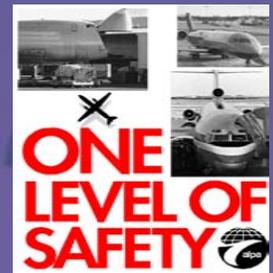
What ALL Cargo Pilots Know

1. Sleep Debt is Cumulative
2. Sleeping on Demand is Unlikely
3. Sleeping in Advance is Impossible



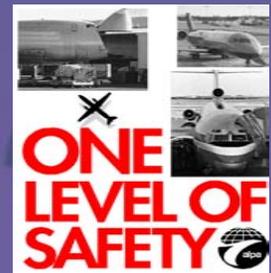
Sleep Debt is Cumulative

- NASA Study showed Night Cargo Pilots lose average of 2 hours per day
- By the end of the week, a sleep debt of 8 hours or more has accumulated
- Additional studies show performance degradation and higher risk of accident after 8 hour sleep debt accumulation



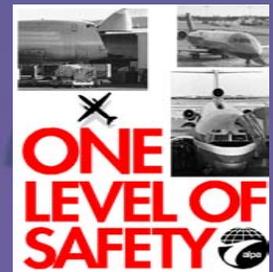
Sleeping on Demand is Unlikely

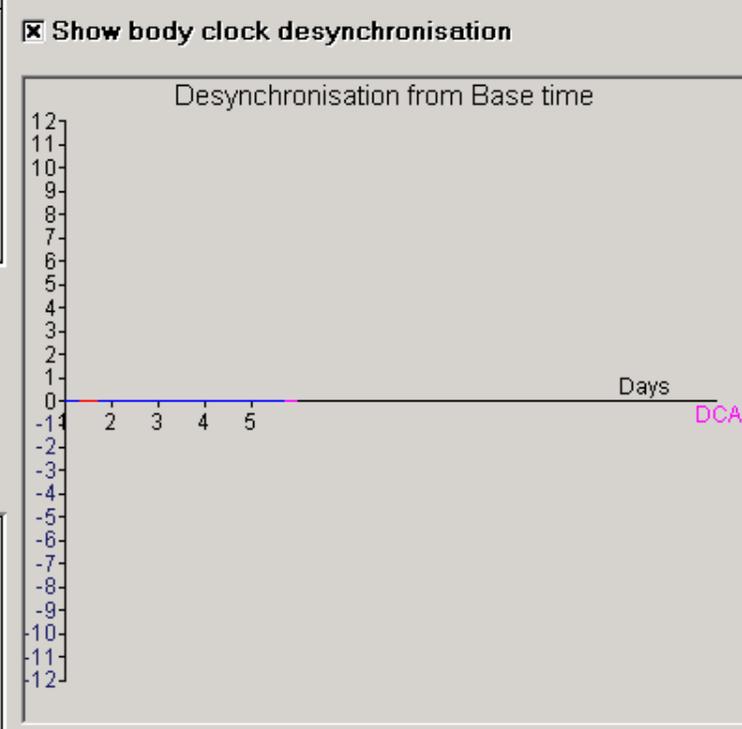
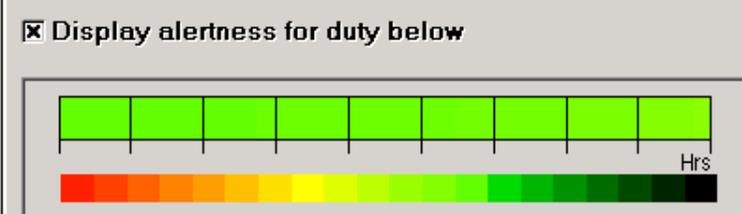
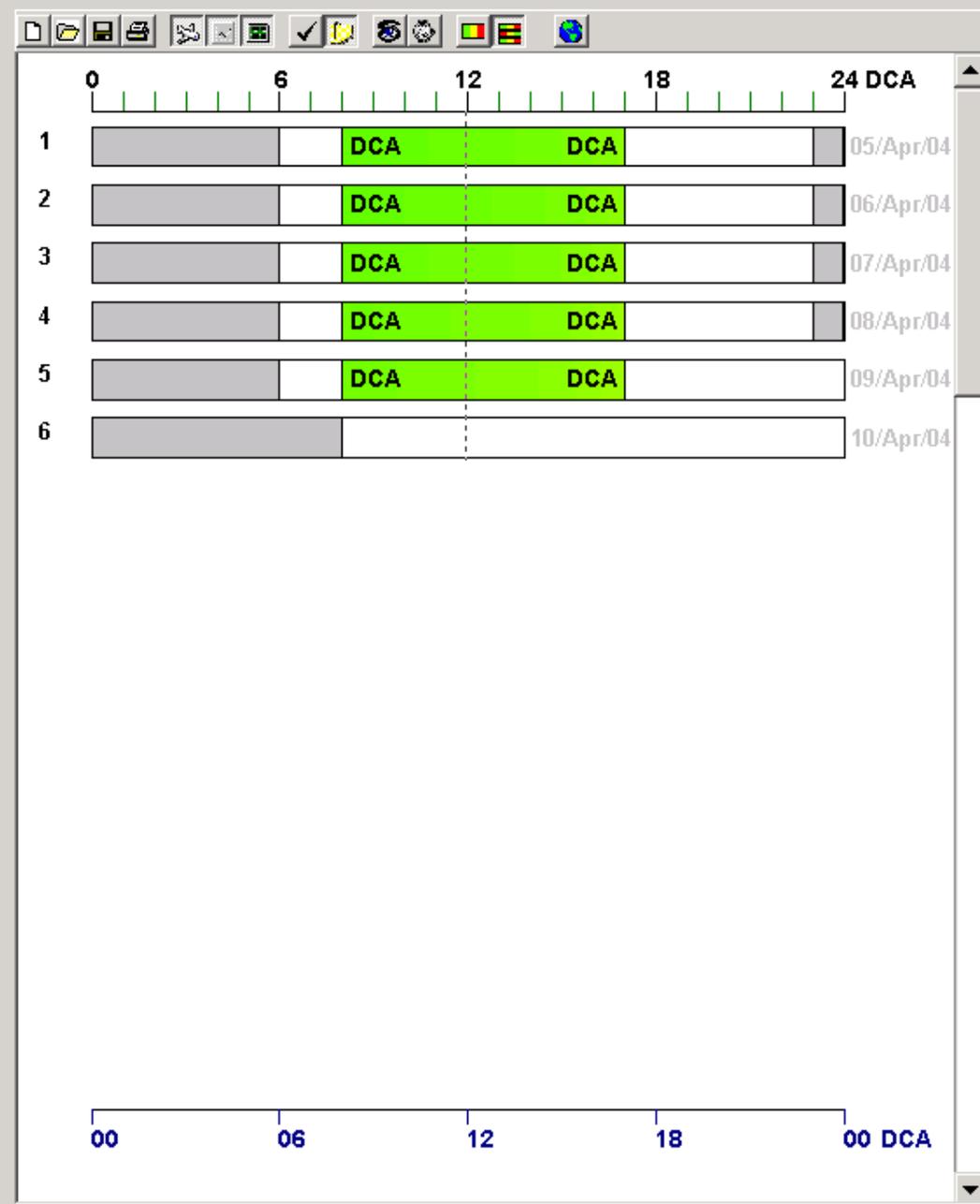
- Scientific evidence has demonstrated that the human body is on a “circadian,” or daily cycle and that the body can typically accommodate only limited adjustment in the cycle without significant impairment in performance



Sleeping in Advance is Impossible

- Scientific evidence and objective and subjective data have proven that the cargo pilot can't "bank sleep" in advance





Plot full screen ◀▶ 1

- Body clock difference form base time
- Selected duty
- Local time

Duties

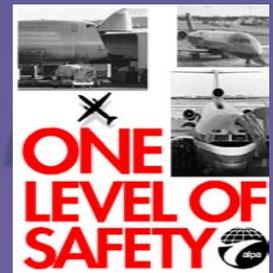
Workload

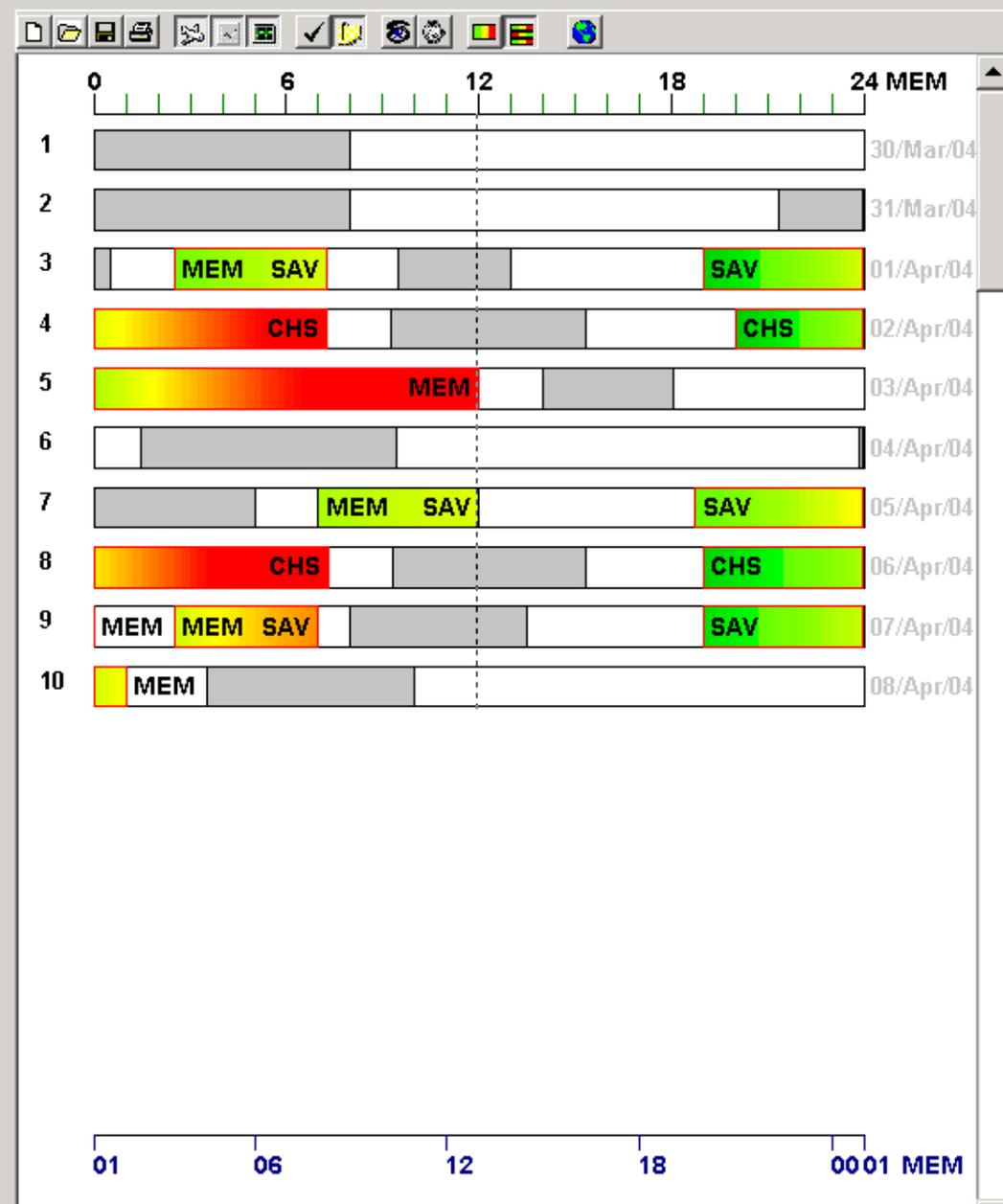
Alertness

Summary

Duties

Cargo Hub Operations – Typical Schedule (Layover)

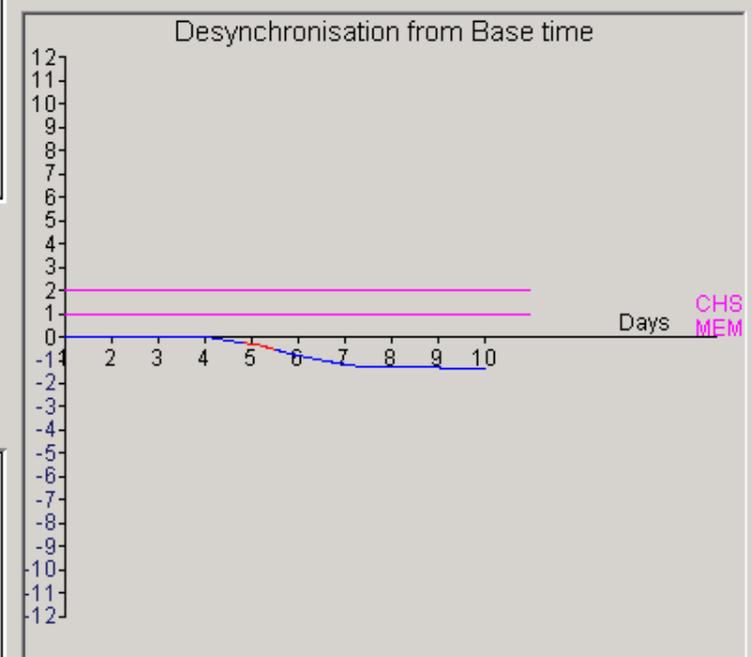




Display alertness for duty below



Show body clock desynchronisation

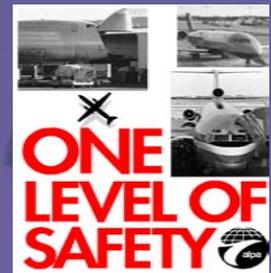


Plot full screen ◀▶ 1

- Body clock difference form base time
- Selected duty
- Local time

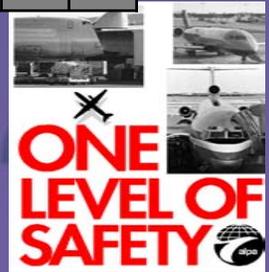
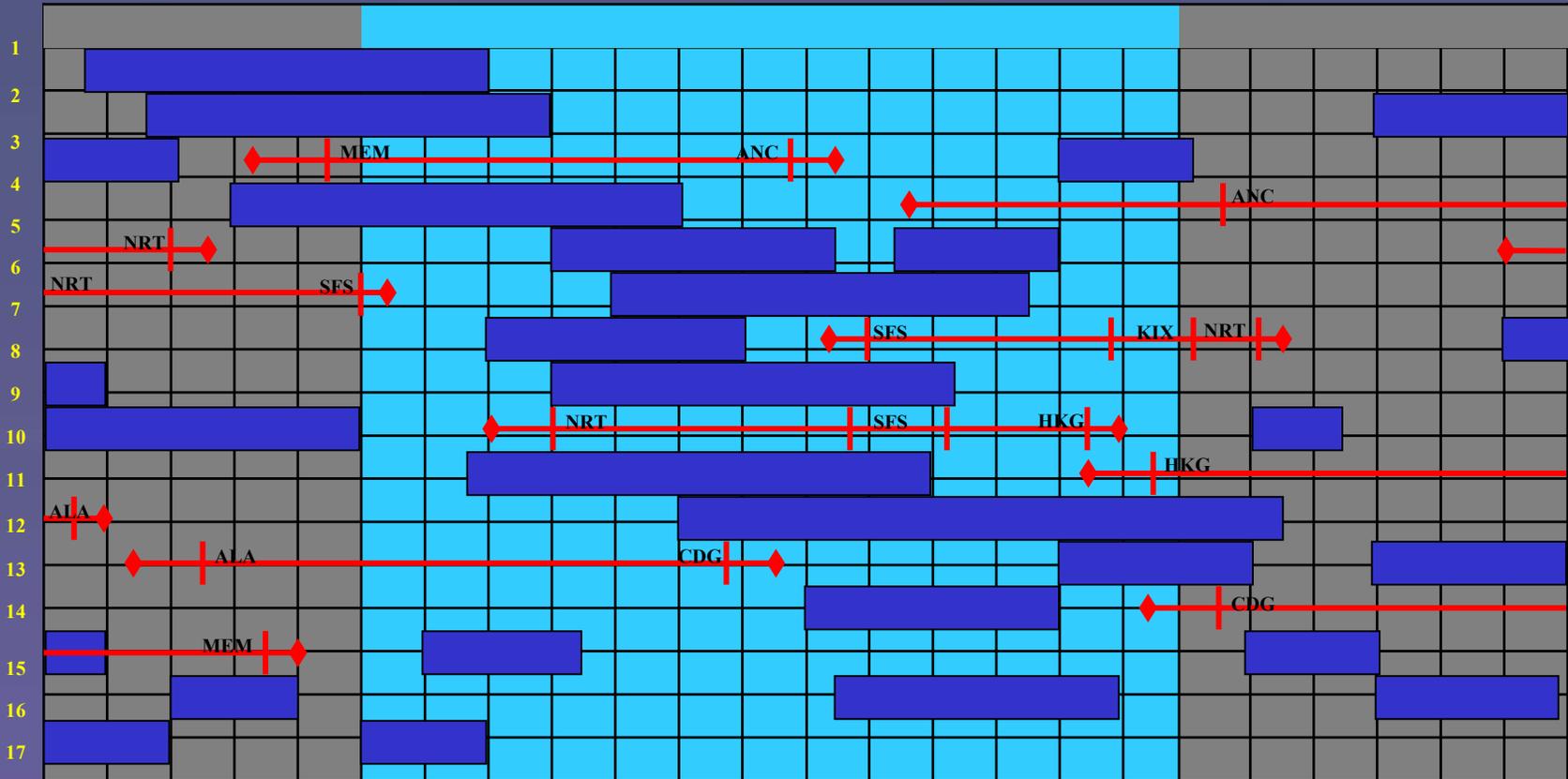
A Real World Example

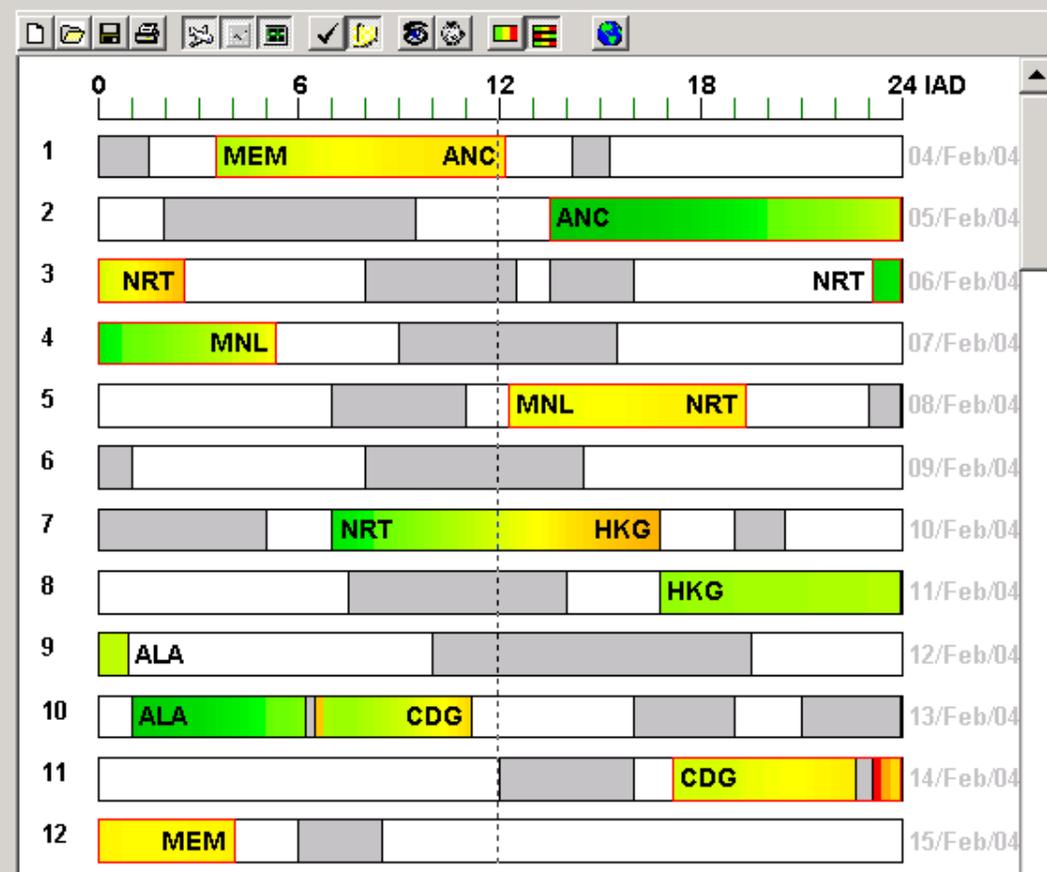
- 11 Day trip
 - 265 hours away from home base
 - 68 hours sleep
 - Normal sleep 88 hours (8 hrs. X 11 Days)
 - Sleep Debt 20 Hours



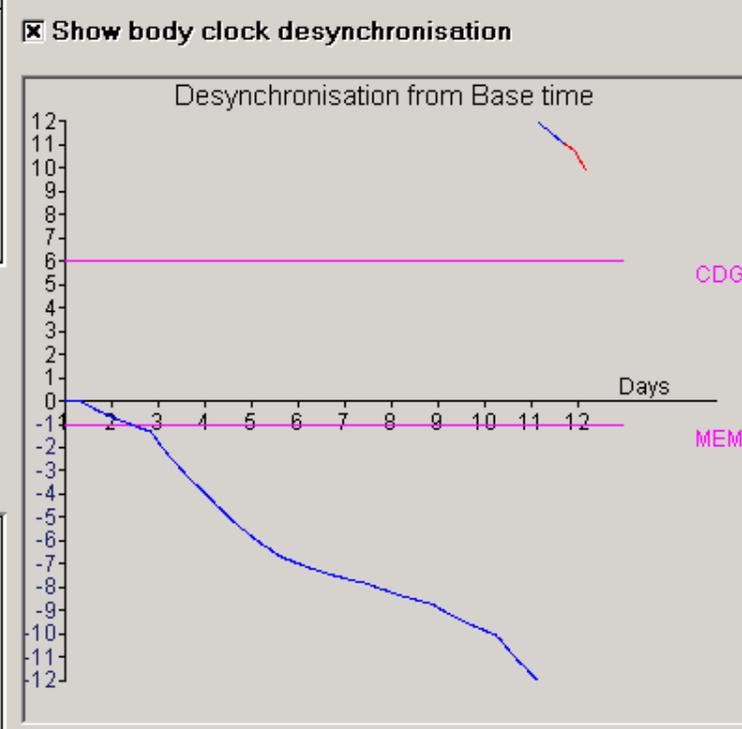
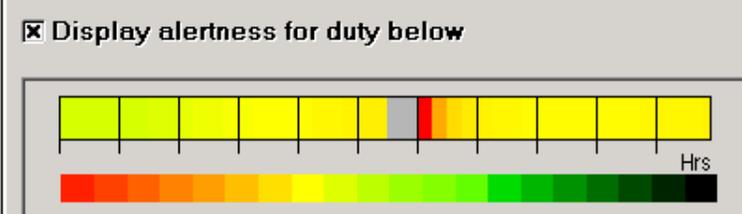
Pilot's Sleep Log

EST 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
 GMT 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 1 2 3 4 5





06 CDG



Plot full screen

Body clock difference form base time

Selected duty

Local time

Workload

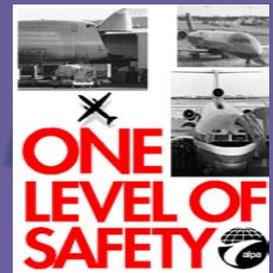
Alertness

Summary

Duties

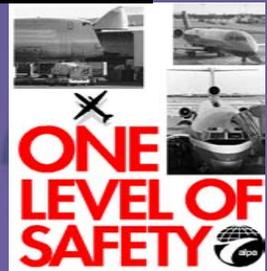
What role has fatigue played in air carrier accidents and how do we identify fatigue?

- Now that we know what we do:
 - How many “pilot error” accidents were really fatigue accidents??



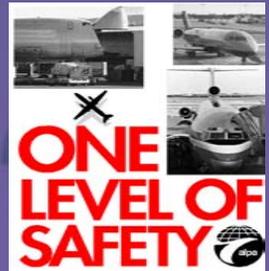
* What the accidents tell us *

- Swanton, OH – Flight 805 (1992)
Air Transport International Cargo (Fatal)



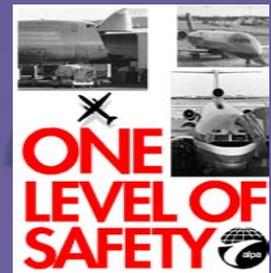
* What the accidents tell us *

- Guantanamo Bay, Cuba – (1993)
- American International Cargo Flight 808



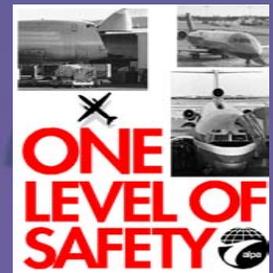
Guantanamo Bay, Cuba, cont.

- First accident where the Safety Board recognized available scientific evidence and found that lack of sleep and circadian disruption were factors in the accident.



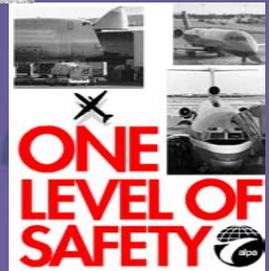
* What the accidents tell us *

- Kansas City, MO – Air Transport DC-8 Cargo (1995)(Fatal)



Probable cause(s) . . .

FAILURE . . . TO ENSURE . . . ADEQUATE . . . REST . . .
INADEQUACY OF [FAA] OVERSIGHT OF . . .
FLIGHT AND DUTY TIME REGULATIONS . . .



Lessons from passenger carriers

- Guam – KAL Flight 801(1997)



JetPhotos.Net - Image Copyright © Mark Durbin

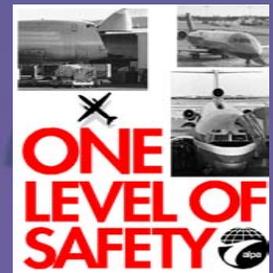


I'm . . . “really. . . sleepy . . .”
(Fatal – 228 killed, 36 injured)



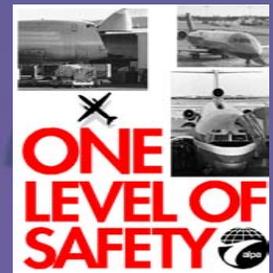
Lessons from passenger carriers

- Little Rock, AR – AAL Flight 1420 (1999)(Fatal) – MD-80 runway overrun



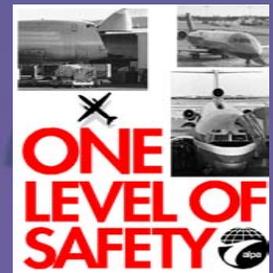
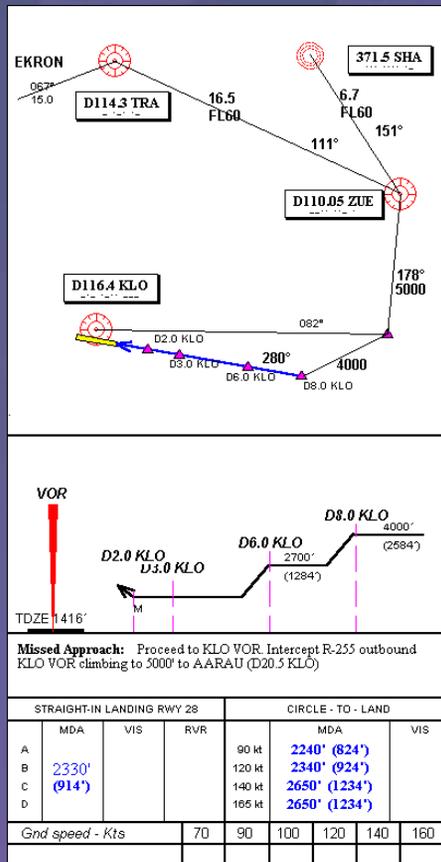
Lessons from passenger carriers

- Crossair 3597 – Avro 146 (4 engine jet), Geneva, Switzerland (2001)(Fatal)



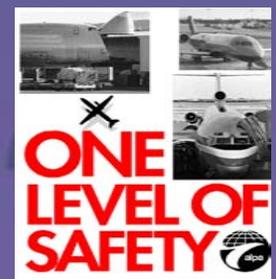
Geneva, cont.

– “Ability to analyze complex processes” found adversely affected by fatigue



Geneva, cont.

Captain's ability to "take appropriate decisions" found by Swiss AIB to be adversely affected by fatigue



Corona, California

11/07/90

RAR-91/03

Sugar Valley, Georgia

08/09/90

RAR-91/02

Brooklyn, New York

Railroad

6/15/91

RAR-95/03

Accident investigation:

Fatigue-related investigations

Corona, California

01/90

RAR-91/03

and studies conducted by the

Special investigation:

Sugar Valley, Georgia

08/09/90

RAR-91/03

National Transportation Safety

Steam locomotives

11/26/96

SIR-96/05

Brooklyn, New York

06/05/95

RAR-96/03

Board since May 1989, by

Special investigation:

mode.

Steam locomotives

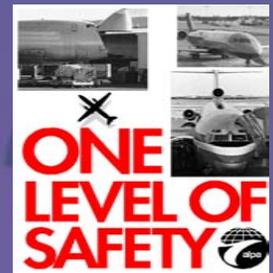
11/26/96^b

SIR-96/05



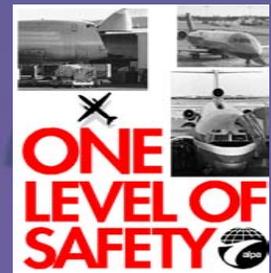
NTSB Most Wanted

- Updating regulations across industry wanted
- Pilots are different
 - Cargo pilots are different



Why Cargo? Why Now?

- Air Cargo pilots are, by the nature of the industry, more exposed to the fatigue risks that scientific evidence and objective and subjective information and data tell us are a danger
- Nature of Air Cargo Operations:
 1. No dispatchers
 2. On-call (non-scheduled) Operations
 3. Aging Aircraft



4. Most cargo flights occur at night

Backside-of-the-clock (late-night) work periods

- are more likely to generate human error
- and the failure to notice such errors
- and the failure to quickly and accurately rectify errors

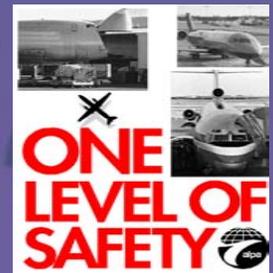


Night Cargo Factors, cont.

- Research has proven that daytime sleep is inferior in quality to that obtained at night

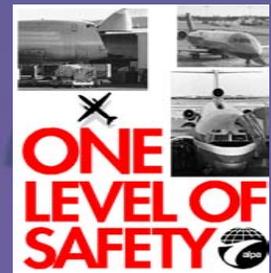
- Visual cues such as depth perception and contrast are degraded; operations in low visibility conditions can be challenging

- *RELEVANT ACCIDENTS: Swanton, OH; Guantanamo Bay, Cuba; Kansas City, MO*



Cargo Factors, cont.

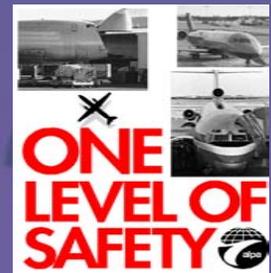
- **5. The route structures and destination airports of cargo airlines frequently differ from those of passenger airlines.**
- Cargo flight crews are exposed to a wide and changing variety of destinations, which decreases the safety margins afforded by route familiarization and/or the familiarity of repeated operations into the same airports.



Cargo Factors, cont.

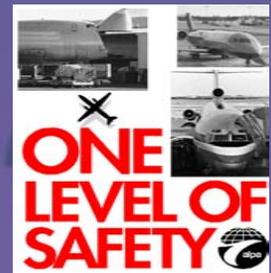
Many cargo airports have less supporting infrastructure than those served by passenger airlines.

- Instrument approaches, runway lighting
- Ground support
- Flight crew briefing rooms, dining facilities, hotels
- Air Traffic Control towers may be closed during late night or early morning cargo operations.
- *RELEVANT ACCIDENTS: Swanton, OH; Guantanamo Bay, Cuba*



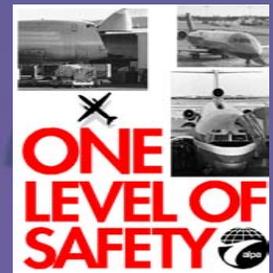
What is needed now and why?

- A single standard of safety for all air carrier pilots
 - Preflight rest requirement
 - Reserve duty time limit (reserve rest)
 - Weekly flight time limits
 - Special consideration for late night & trans-meridian flying



Impediments to Solution

- Governmental insistence on sweeping industry wide overhaul of regulations
 - Sweeping overhaul not needed to fix narrow and well identified problem in rules applicable to air cargo pilots
 - Current flight time/duty time regulations applicable to air cargo pilots contrary to science and lessons from accidents



How to solve the problem

- Apply Domestic and Flag Rules to Part 121 Air Cargo Carriers
- Single Level of Safety



Thank You

